

WHAT IS CLAIMED IS:

1. A current source circuit, comprising:
  - a reference current source supplying a reference current;
  - 5 a first transistor group connected in series to the reference current source, and converting the reference current into a voltage;
  - a first transistor having a current mirror relationship with the first transistor group, and allowing an output current to flow therethrough;
  - an error amplifier receiving a voltage generated in the first transistor group at one input terminal, and comparing the voltage at the one input terminal with a voltage supplied to the other input terminal;
  - 10 a second transistor driven with an output voltage of the error amplifier;
  - a third transistor driven with the output voltage of the error amplifier, and allowing an output current to flow therethrough in a direction opposite to the output current of the first transistor with respect to an output terminal;
  - 15 and
  - a second transistor group connected in series to the second transistor, and converting a current flowing through the second transistor into a voltage to supply the voltage to the other input terminal of the error amplifier.
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2. A current source circuit, comprising:
  - a reference current source supplying a reference current;
  - a first transistor connected in series to the reference current source,
  - 25 and converting the reference current into a voltage;
  - a second transistor having a current mirror relationship with the first transistor, and converting a current into a voltage;
  - a third transistor having a current mirror relationship with the first transistor, and allowing an output current to flow therethrough;
  - 30 an error amplifier receiving a voltage generated in the second transistor at one input terminal, and comparing the voltage at the one input terminal with a voltage supplied to the other input terminal to output an error voltage;
  - a voltage source supplying a voltage to the other input terminal of the error amplifier;
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  - a fourth transistor connected in series to the second transistor, and driven with an output voltage of the error amplifier; and

a fifth transistor driven with the output voltage of the error amplifier, and allowing an output current to flow therethrough in a direction opposite to the output current of the third transistor with respect to an output terminal,.

5     3. An amplifier comprising:

        a reference current source supplying a reference current;

        a first transistor connected in series to the reference current source, and converting the reference current into a voltage;

        a second transistor having a current mirror relationship with the first  
10     transistor, and converting a current into a voltage;

        a third transistor having a current mirror relationship with the first transistor, and allowing a first current to pass therethrough;

        an error amplifier receiving a voltage generated in the second  
15     transistor at one input terminal, and comparing the voltage at the one input terminal with a voltage supplied to the other input terminal to output an error voltage;

        a voltage source supplying a voltage to the other input terminal of the error amplifier;

        a fourth transistor connected in series to the second transistor and  
20     driven with an output voltage of the error amplifier;

        a fifth transistor driven with the output voltage of the error amplifier and allowing a second current to flow therethrough; and

        a differential amplifier operated using the first current flowing  
25     through the third transistor as one supply current and using the second current flowing through the fifth transistor as the other supply current, and amplifying a voltage supplied to an input terminal.

4. The amplifier according to claim 3, wherein the reference voltage at an  
30     operation point of the differential amplifier is set to be the voltage of the voltage source.

5. An amplifier comprising:

        a reference current source supplying a reference current;

        a first transistor connected in series to the reference current source,  
35     and converting the reference current into a voltage;

        a second transistor having a current mirror relationship with the first transistor, and allowing a first current to pass therethrough;

a third transistor having a current mirror relationship with the first transistor, and allowing a second current to pass therethrough;

5 a first differential amplifier operated using the first current flowing through the second transistor as one supply current, and receiving a voltage supplied to an input terminal;

an error amplifier receiving an output voltage of the first differential amplifier at the one input terminal, and comparing the voltage at the one input terminal with a voltage supplied to the other input terminal to output an error voltage;

10 a voltage source supplying a voltage to the other input terminal of the error amplifier;

a fourth transistor operating the first differential amplifier, using a third current driven to flow with an output voltage of the error amplifier as the other supply current;

15 a fifth transistor driven with the output voltage of the error amplifier, and allowing a fourth current to pass therethrough; and

a second differential amplifier operated using the second current flowing through the third transistor as one supply current and using the fourth current flowing through the fifth transistor as the other supply current,  
20 and amplifying a voltage supplied to the input terminal.

6. The amplifier according to claim 5, wherein a reference voltage at an operation point of the second differential amplifier is set at a voltage of the voltage source.

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